

“Planning for cost-effective environmental risk reduction in China”  
“构建高效的环境风险防范规划体系”



# Integrated river basin management in the Rhine river:

*EU's approach to regional cooperation  
in protecting water resources and  
reducing risks to health and ecology*

莱茵河综合流域管理：欧盟在保护水资源和降低健康、生态风险的区域性合作

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# Content

## 主要内容

- The EU Water Framework Directive (WFD)  
欧盟水资源框架指令(WFD)
- Characteristics of Rhine  
莱茵河的特点
- River Basin Management in the Rhine Basin  
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- Results so far  
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# The EU Water Framework Directive (WFD)

## 欧盟水框架指令（WFD）

- Legal framework for all water management in EU  
欧盟所有水管理的法律框架
- In force in 2000, objectives should be achieved in 2027  
2000年实施, 2027年必须实现目标
- Background:  
背景:
  - Unsustainable use leading to deteriorated and altered surface and ground waters  
不可持续的利用导致地表水和地下水受到污染
  - Water is a limited resource  
水是一种有限的资源

# The EU Water Framework Directive (WFD)

## 欧盟水框架指令 (WFD)

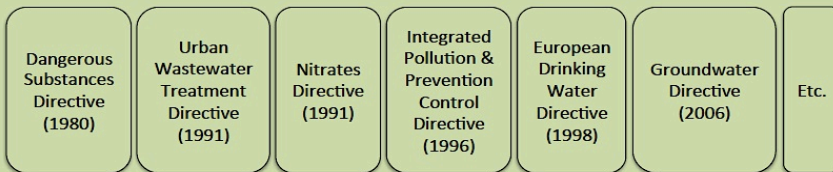
- Overarches several thematic directives and national water legislation
- 在此框架下产生了许多专项法令和国家层面的立法

### The Water Framework Directive (2000)

- Qualitative goals for all surface water and ground water bodies in the EU
- Common strategy for implementation via River Basin Management Plans

### Different EU-directives related to water and environment

- Incorporating WFD requirements and including different thematic requirements



### National water legislation

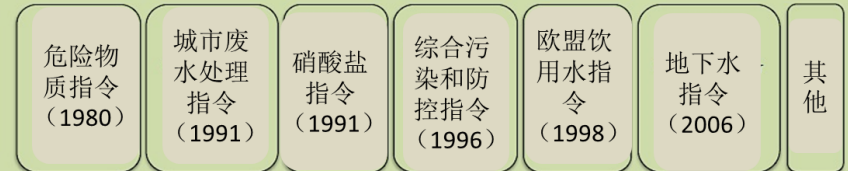
- Incorporating EU requirements (ref. above) and including additional national requirements that don't interfere with EU obligations

### 欧盟水框架指令 (2000)

- 欧盟地表水、地下水水质目标
- 流域管理规划实施共同战略

### 与水 and 环境相关的欧盟指令

- 包括WFD要求和不同专项性要求



### 国家层面有关水的立法

- 包括欧盟要求和与欧盟规定相冲突的专项性要求

# Purpose of WFD

## WFD的目的

- Prevent deterioration, protect and enhance aquatic and terrestrial ecosystems and wetlands  
保护水生和陆地生态系统以及湿地
  - Close to natural conditions 接近自然状况
- Promote sustainable water use 促进可持续的水资源利用
- Reduce pollution of groundwater 减少地下水污染
- Mitigate effects of floods and droughts 降低洪水和干旱影响
- Achieve good status in surface waters 改善地表水
- Prescribes steps to reach common goals 规定实现共同目标的步骤
- Based on principles of 基于以下原则:
  - Polluter pay, precautionary, subsidiarity, water as a common heritage, balanced development, transparency, cost effectiveness, cost recovery, cooperation and legal enforcement

污染者付费、防范性、辅助性、水是一种共同遗产、协调发展、透明性、成本-效果、成本可回收、合作与法律强制性

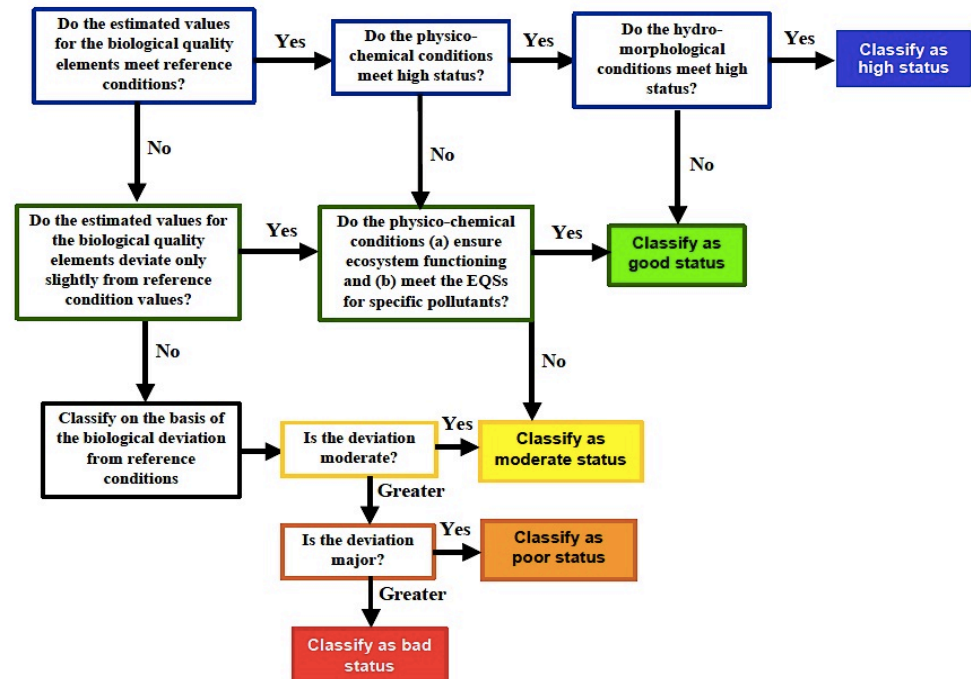
# Goals of WFD

## WFD的目标

- Qualitative goals for water bodies 水质目标
- Member States are required to carry out the necessary measures to reach these qualitative goals 成员国应采取必要的措施以实现这些水质目标
- Surface water 地表水
  - Good ecological status 良好的生态状况
  - Maximum ecological potential for modified water bodies 最大程度实现水生态功能
  - Good chemical status 良好的化学物质状况
  - Specific requirements and goals for certain areas 特定区域内的具体要求和目标
  - High, Good, Moderate, Poor & Bad status 优、良、中、差、很差
- Groundwater 地下水
  - Natural or polluted 自然的或受污染的
  - Precautionary approach -> prohibits direct discharges 预防→禁止直接排放

# Common environmental targets/ standards 环境目标/标准

- Intercalibration in order to define high and good status for different water bodies/types 标准化以界定不同水体好的水质状况
- Expert-based assessment 基于专家的评估
- Quality elements referring to 质量要素涉及
  - biology, 水生生物
  - hydro-morphology, 水生形态
  - chemical and physiochemical elements 化学物质与理化性质
- Stepwise assessment:
- 评估流程:



# Elements of WFD

## WFD要素

- River Basin Management Plan 流域管理计划
  - Description of the characteristics and of significant anthropogenic pressures and their impact on the status  
描述流域特征以及重要的人为压力和压力造成的影响
  - Environmental objectives 环境目标
  - Map of the relevant monitoring networks 相关监测网络地图
  - Presentation of the results of the monitoring programmes  
监测结果报告
  - Summary of the programmes of measures, including the ways in which the mandated objectives are thereby to be achieved  
相关措施总结，包括实现强制目标的方式
- Public participation 公众参与
- Monitoring 监测



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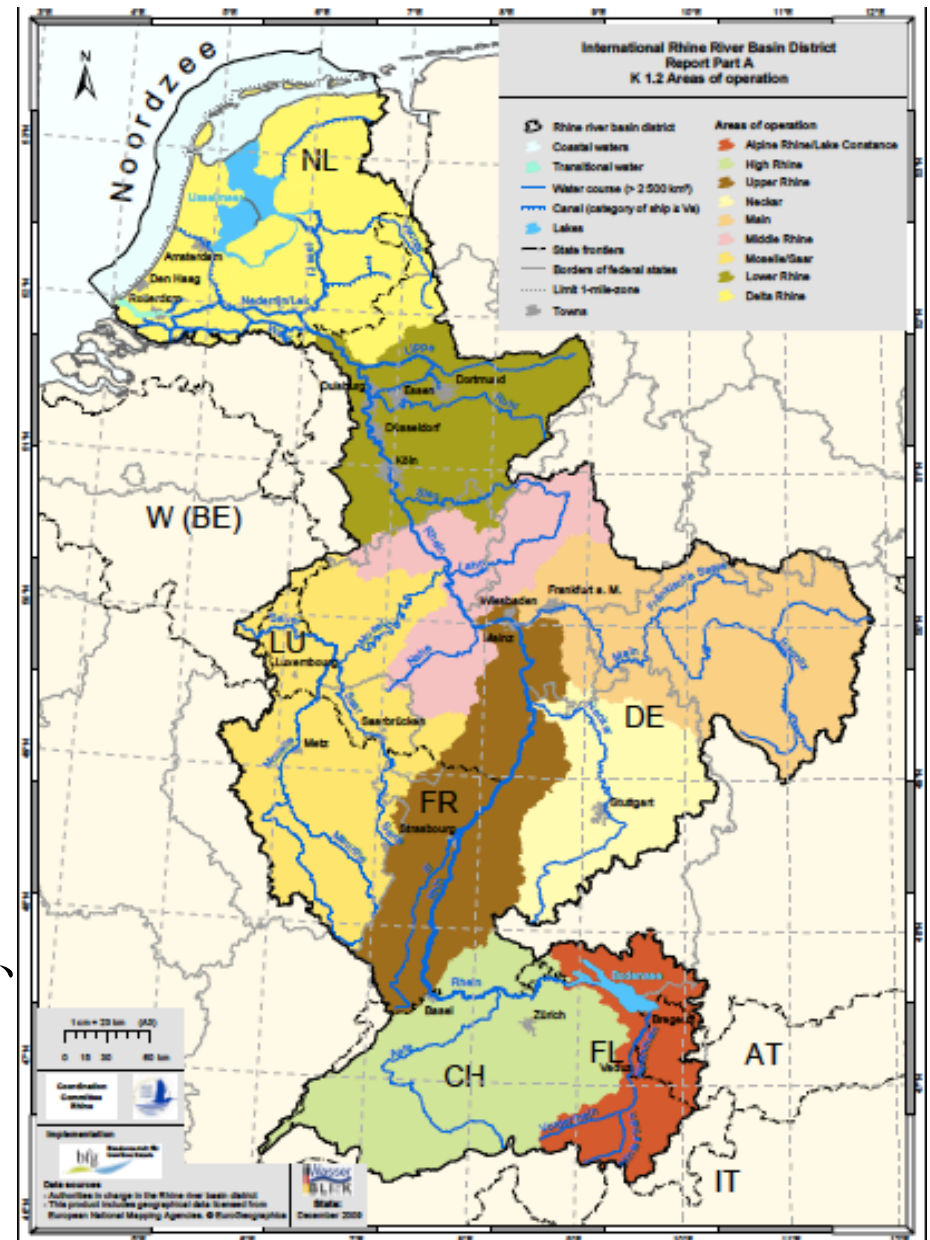
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# Rhine River Basin

## 莱茵河流域

- One of the longest and most important rivers in Europe  
欧洲最长、最重要的河流之一
  - 1,230 km 1230公里
  - 9 countries 9个国家
  - 58 mill. People 5800万人口
- Waterway for trade and goods for 2000 years 作为贸易和货运水上通道已有2000年的历史
- Transport, hydropower, waste water management, industry, agriculture, drinking water, flood protection, leisure 交通、水力发电、废水管理、工业、农业、饮用水、防洪、休闲
- Once "the open sewer of Europe" 曾被称作“欧洲的下水道”



# History 历史

- 1815: international agreement: free shipping  
1815年，签订自由航运协议
- 1950: International Commission for the protection for the Rhine (ICPR)  
1950年，成立“保护莱茵河国际委员会”
- 1968: International Commission for Research on Floods on the river Rhine  
1968年，莱茵河洪水研究委员会
- 1986: Sandoz chemical spill & The Rhine Action Programme  
1986年，Sandoz化学品泄漏与莱茵河行动计划
- 2001: Rhine 2020  
2001年：莱茵河2020



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# Integrated River Basin Management, IRBM

## 综合流域管理

- IRBM: coordinated conservation, management and development of water  
IRBM: 协调保护、管理与开发
- WFD provides the basis for the Rhine RBM  
为莱茵河综合流域管理提供基础
- WFD Builds on earlier established cooperation 基于已有的合作
- Two-level management plan 两个层面的管理计划
  - A: overall level, 1 plan 总体层, 1个计划
    - Major water management issues affecting the entire river basin  
影响整个流域的主要水管理问题
    - Biological river continuity, reduction of pollution and harmonisation of water uses  
河流生态延续性, 降低水污染及水资源利用的协调性
    - Developed by the Rhine Coordination Committee and representatives for all countries  
莱茵河协调委员会和流域所有国家代表共同制定
  - B: sub-basin level, 9 plans 子流域层, 9个计划
    - Regional issues and problems 流域事项和问题
    - Developed by representatives for countries and institutions involved  
流域所有国家代表和相关机构共同参与制定
  - + National management plans  
+ 国家管理计划

# Inventory (2004) 清单 (2004)

- Established the baseline
- 基线建立
  - Nitrogen resulting in coastal water pollution, but not a problem on a local scale
  - 沿岸水污染导致氮污染
  - Problematic pollutants mainly remnants of former inputs or of diffuse origin
  - 污染物大多来源于面源
- 88% of the water bodies heavily modified
- 88%的水体已经发生严重变化





# The management plan 管理计划

- Lists **protection areas** (*regional risk*)
- 列出保护区域（区域风险）
  - Drinking water 饮用水
    - EU Drinking water Directive 欧盟饮用水指令
    - water supply zones and monitoring programmes 水供应区域及监测计划
  - Natura 2000 自然2000
- **Programme of measures** 措施计划
  - restoration of biological river continuity 河流生态延续性修复
  - Increased habitat diversity 增加栖息地多样性
  - reduction of pollution from diffuse sources 降低面源污染
  - Based on technical reports and separate plans 基于技术报告和单项方案

# Handling acute risk 突发性风险应对

- Flood risk management plans 洪水风险管理计划
- Prevent accidents and ensure security of industrial plants 事故预防和工业企业安全保障
  - Warning and Alarm Plan in 1986 1986年的预警计划
  - Seven international main warning centres in main cities along the main river collect and distribute the messages
  - 在主要河流沿岸城市成立7个国际预警中心负责收发信息
  - Alarm messages are passed on upstream (search messages) and downstream (information or warning) with standardised forms in three languages (German, French, Dutch).
  - 预警信息以德语、法语、荷兰语三种语言的标准格式向上游（溯源）、下游（预警）传递



# Burden sharing

- Sub-basin and national levels basic (level B)
- Principles of water pricing and the polluter pays principle applied in the program of measures
- Transparent and open process
  - All baseline data available to the public
  - Inventory of the baseline, local targets according to typologies, emission pathways and identification of remaining problems and sources in an open manner very important.
  - Better and shared understanding of the situation between all stakeholders
  - Industry, agriculture and water transport companies aware of their role and stimulated in a constructive and pro-active manner
- Soft measures applied
  - Education, raising awareness programs and government support for difficult transition processes
- Process contributed to the development of high environmental standards
  - German chemicals industry, contributing to competitiveness and global technological leadership.
  - Investment of industry to reduce environmental risks may have long-term positive effects for the industry itself.

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# Results 结果

- From the “open sewer of Europe” to a living river
- 由“欧洲下水道”转变为一条生机勃勃的河流
- Model example internationally of integrated river basin management. 综合流域管理的典范
- Comprehensive and science-based system of policies, regulations and institutions 建立了政策、法规及制度基于科学的综合性体系
- Success story representing best practice for river management on a large scale, where environmental, social and industrial economic activity is balanced.
- 树立了环境、社会和经济协调发展河流管理的成功经验
- Water bodies with ‘good’ or ‘moderate’ status 41% in 2009, expected to increase to 66% in 2015
- 2009年“良好”、“中等”水体占到41%，预计2015年达到66%
- But problems still remain 仍然存在的问题
  - Emscher river 埃姆舍河

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# Lessons for China 对中国的启示

- Legal framework committing relevant authorities and stakeholders to reduce environmental risk and reach environmental quality targets, with sanction mechanisms.  
通过约束性措施建立涵盖政府及其他相关者在内的法律框架体系以降低环境风险、实现环境质量目标
- Inventory mapping the baseline situation for environmental risks, including emission pathways and current water uses, at sub-regional/provincial level and river basin level.  
建立了衡量环境风险基本状况的清单，包括子区域/省级和流域层面排放渠道、当前水体功能
- A register of priority areas, such as environmental protection areas and drinking water sources, at sub-basin/provincial level and river basin level.  
优先区域确定，例如区域/省级和流域层面环境保护区域、饮用水水源
- Environmental targets for water bodies based on the typologies of water bodies, aiming to reach a close to natural condition and a healthy environment.  
基于不同水体类型确定水体环境目标，旨在达到接近自然状况和一个健康的环境

# Lessons for China 对中国的启示

- Assess the effect of current legislation and measures, and identify gaps between current measures and environmental targets.  
评估目前立法、措施的影响，识别目前措施与环境目标的差距
- Identify needed measures at river basin level and at sub-river basin/provincial level, both levels should include  
识别流域及子流域/省级层面需求的措施
  - Accumulated and acute risk, 累积性和突发性风险
  - Cost-effective program of measures 措施的费用效果评估
  - Dialogue with major stakeholders including coordination mechanisms.  
于主要相关者的对话，包含协调机制
- Open and transparent process,  
开放和透明的过程
  - All data made available to the public on public platforms such as the internet 所有的数据对公众公开，例如通过网络
  - Program of soft measures at all levels to develop common understanding and awareness. 采取不同层面的软措施，以形成共识